Wireless Thermo Recorder

RTR-51 / RTR-52

Wireless Temperature Data Logger

User's Manual

Thank you for purchasing this product.
Carefully read and fully understand these instructions before using this unit.

T&D CORPORATION

© Copyright 2003 T&D Corporation. All rights reserved. 2003.7 16004244070

⚠ Wireless Regulations

Radio, EMC and Safety Regulations

CE

- RTR-5 Series complies with technical specifications required under EN 301 489-3 (with battery and AC Adaptor), EN 300-220-3 and EN 60950:2000.
- Allowed to use in : A.B.D.DK.F.I.P.S.SW.UK.N.NL.CH. FIN.AUS.NZ

Inquiries

T&D CORPORATION
5652-169 Sasaga Matsumoto City NAGANO 399-0033 JAPAN
Tel:+81-263-27-2131 Fax:+81-263-26-4281
E-mail: overseas@tandd.co.jp
Homepage: http://www.tandd.jp

Product Specifications

	RTR-51	RTR-52
Measurement Channels	1 Temperature Channel	
Measurement Item	Temperature	Temperature
Internal Temp. Sensor	-40℃ to 80℃	-
External Temp. Sensor	-	-60℃ to 155℃
Measurement Display Resolution	0.1℃	
Measurement Accuracy	Avg. ± 0.5℃	Avg. ± 0.3℃ (-20 to 80℃) Avg. ± 0.5℃ (-40 to -20/80 to 110℃) Avg. ± 1.0℃ (-60 to -40/110 to 155℃)
Recording Interval	1,2,5,10,15,20,30 seconds, 1,2,5,10,15,20,30,60, minutes, Total of 15 choices (Excluding Event data)	
Recording Interval	16,000 readings × 1 Channel	
Recording Mode	Endless (Overwrite oldest data when capacity is full) ・ One-time (Stop reading when capacity is full)	
LCD Display Items	Current Readings ・ Recording Settings ・ Battery Life Warning ・ Over Measurement Range Warning ・ Unit	
Power	Lithium Battery (LS14250(SAFT)) × 1 or AC Adaptor (sold separately)	
Battery Life	Approx. 6 months / Approx. 2.5years with RTR-05B (Battery life depending on measurement environment, recording interval and battery performance)	
Communication Method:	Optical Communication, Wireless (Radio Wave) Communication	
Wireless Method	ETSI EN 300-220	
Transmission Distance	Up to 100 meters (May vary with conditions)	
Interface	Wireless Communication (RTR-57C) ・ Optical Communication (RTR-57C, TR-57C, TR-50C)	
Communication Speed	When downloading data (Wireless) Approx. 2,000 readings per minute [Collection of a full unit of data=Approx. 420 seconds (optical communication=Approx. 160 seconds)]	
Water Resistance*1	IP67 (immersion proof)	IP64 (rated for use in daily life)*2
Dimensions	H62 x W47 x D19mm (excluding protrusions / antenna length 20mm) / with Large Capacity Battery Pack: D50mm	
Weight	Approx. 56g. (including 1 lithium battery) / with Large Capacity Battery Pack : Approx. 109g	
Unit Temp. Resistance	-40℃ to 80℃	
Standard Sensor / Input Cable	-	TR-5106(length: Approx. 0.6m) × 1
Accessories Included:	Lithium Battery (LS14250 (SAFT)) × 1 ・ Tube × 1, Strap × 1 ・ User's Manual (Warranty) × 1	

*1. Note: Not for continued immersion.
*2. Note: The Water resistance rating with the sensor or input cable connected is IP64

◆ Notices about this User's Manual

- Please read this manual carefully before using the product.
- All rights of this User's Manual belong to T&D Corporation. It is prohibited to use, duplicate and/or arrange a part or whole of this User's Manual without the permission of T&D Corporation.
- Please follow the safety precautions carefully. We cannot guarantee nor are we responsible for safety if this product is used in any manner other than was intended.
- T&D Corporation accepts no responsibility for any malfunction of and /or trouble with this product or with your computer that is caused by the improper handling of this product and will deem such trouble or malfunction as falling outside the conditions for free repair of the attached warranty.
- T&D Corporation accepts no responsibility for any result or effects from using this User's Manual.
- Figures and illustrations in this manual may be slightly simplified and may differ from the actual product.
- On screen messages, figures or illustrations in this manual may vary slightly or be simplified from the actual messages and product.
- We sincerely hope that the contents of this manual are true and complete. If you find any information to have been omitted, or if the information within is confusing or mistaken, please contact your retailer or T&D Corporation.
- Microsoft ®, Windows ® and WindowsNT® are registered trademarks of Microsoft Corporation USA and are binding in the USA and all other countries. Company names and product names are trademarks or registered trademarks of each company.
- This User's Manual cannot be reissued, so please keep it in a safe place.
- Please carefully read this User's Manual and Free Repair Warranty.

◆ Safety Precautions and Instructions

※ Please carefully observe the following safety measures when using our product.

To prevent any loss or damage to our customers, other people and / or property, and to ensure the proper use of our products we ask that before using our product you carefully read, understand and follow the safety rules and precautions for our products as outlined below.

[Explanation of Warning Symbols]

DANGER	These entries are actions that absolutely under no circumstance should be taken. The taking of such an action may cause serious personal physical damage or death.
CAUTION	These entries are actions that if taken may lead to physical injury or damage to persons or things.

[Explanation of Picture Symbols]

△	This symbol denotes an important warning or caution. Inside or near the symbol will appear another symbol giving details. (EX: ⚠ stands for Fire or ELECTROCUTION)
⊘	This symbol denotes a forbidden action. Inside or near the symbol will appear another symbol giving details. (EX: ⊘ stands for DO NOT TAKE APART)
●	This symbol denotes an action that you must take. Inside or near the symbol will appear another symbol giving details.

⚠ DANGER

Do not take apart, repair or modify the main unit.
It may cause fire, electrocution or damage. Ask the shop where you purchased the product or T&D Corporation to carry out any repairs.

If any smoke or strange smells are emitted from the unit, immediately cease using it.
Continued use may cause fire, electrocution or damage.

Do not use any batteries other than those that are recommended. It may cause fire or damage.

If water or a foreign object enters the case, immediately cease using it.

Store all batteries, sensors and Thermo Recorder units out of the reach of children. It is dangerous to swallow batteries.

Please be careful when using the units in overly hot or cold environments; touching the units may cause burns or frostbite.

The RTR-51 / RTR-52 are devices to measure temperature. Do not use this unit for any purpose other than temperature measurement.

⚠ CAUTION

T&D is not responsible for any malfunction or trouble caused by the use of our product or any problem caused by the malfunction of our unit. Please be fully aware of this before using our product.

This product has been designed for private or industrial use only. It is not for use in situations where strict safety precautions are necessary such as in connection with medical equipment whether directly or indirectly.

Do not drop or expose the unit to strong impact.

Do not put your fingers or foreign matter into the sensor connection.

Battery terminals may provide insufficient contact due to age or vibration. Please be careful not to lose data due to insufficient contact

Battery life depends on the measurement environment, communication frequency, recording interval and battery quality.

Pay attention to water leakage or foreign objects entering into the unit case as in the following cases.
- The case was closed with dust, hair, etc., on the rubber packing or in the groove for the packing.
- The rubber packing becomes damaged. (In this case, please purchase the optional maintenance set.)
- The unit suffered from significant temperature change while wet. Especially if the temperature change is from high to low.

Operate the units with [T&D Recorder for Windows Ver1.00 (E)].

Remove batteries from any unit that is not to be used for a long period of time. Batteries left in a unit not being used for a long time may leak and cause a malfunction.

Do not use or store the unit in places such as listed below:
It may cause electrocution, fire or damage to the unit or to your computer.
- Areas exposed to direct sunlight
- Areas exposed to water or high-pressure water flow.
- Areas exposed to organic solvents and corrosive gas.
- Areas exposed to strong magnetic fields
- Areas exposed to static electricity.
- Areas exposed to fire or overheating.
- Areas exposed to excessive dust or smoke.

TR-5106, Standard Sensor of RTR-52
- Do no fold the sensor (tip section) or expose it to a strong impact. This may cause trouble or break the wire.
- The sensor and the cable are shielded by Teflon® . If the shield has a defect or tear, the waterproof capacity is lost as the shield is very thin. Inspect it before operation.
- Insert the sensor tip of least 5cm or more to obtain on accurate temperature measurement.
- Only use the sensor within the sensor heat-durability range.

Wireless Thermo Recorder RTR-51/RTR-52

1. Outline of System

This system makes use of the RTR-51/52 unit to measure and record temperature data, which can then be downloaded via wireless transmission to our handheld RTR-57C Data Collector Unit. The RTR-57C Unit can then be connected to your computer for data analysis and management with our exclusive software.
Besides the collection of recorded data, it is possible to monitor current temperature readings, start recording and check data anytime without physically collecting the RTR-51/52 units. Communication between units can be done via optical communication, as well as wireless communication.

Basic Functions of RTR-51/52

■ Wireless Communication Function

Via special short wave radio communication recorded data can be downloaded from an RTR-51/52 unit and saved to the RTR-57C Data Collector Unit. Recording settings and recording start can also be controlled via wireless communication.

● Wireless Communication can occur between an RTR-51/52 Unit and an RTR-57C Unit within a range of up to about 100 meters, if unobstructed and direct.

Note: In order to collect data via wireless communication, it is necessary to register via computer the RTR-51/52 unit as a Remote Unit in the RTR-57C Unit you wish to use. For details about making these settings, please see the Help Menu in [T&D Recorder for Windows] or the User's Manual for [T&D Recorder for Windows].

● Wide Temperature Measurement Range

RTR-51 (Internal Sensor) can measure between – 40℃ to 80℃
RTR-52 (External Sensor) with the included sensor, can measure from – 60℃ to 155℃ .

■ Setting the Recording Conditions

The recording conditions include [Recording Mode], [Recording Interval], [Start Recording Date and Time] and [Unit of Temperature]. You can easily make the necessary changes to these conditions to fit your recording needs.

● Recording Mode: Select from two types of Recording Mode

ONE-TIME MODE:When the data capacity of 16,000 readings is reached, the LCD display will indicate [FULL] and recording will stop.
ENDLESS MODE: When the data capacity of 16,000 readings is reached, the data will be erased in order from the oldest data first and recording will continue.
*Below is an estimate of the amount of time it will take for the unit to become [FULL] in the ONE-TIME MODE.
Calculation Example:
30sec (recording interval) x 16,000 readings (capacity limit) = 480,000 seconds = about 5 days and 13 hours.

Recording Interval	1 second	30 seconds	15 minutes	60 minutes
Time period	4 hours 26 min.	5 days 13 hours	166 days 16 hours	1 year 10 months

■ Starting and Stopping Recording

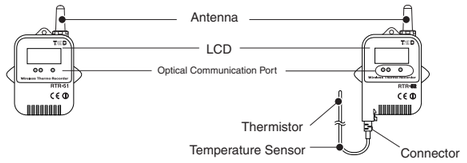
You can make settings to control the starting and stopping of recording.
NOTE:
- By starting a new recording, all data previously stored in the data logger unit will be erased.
- If you want to save the data make sure to download it and save it in an RTR-57C Unit or in your computer before starting a new recording.

■ Downloading Data = (Data Collection)
After downloading you can save the data into files and folders, create graphs, make data tables, create text file format files for use with popular spreadsheet software, and print graphs and tables.

■ Setting Upper and Lower Limits
By making upper and lower limit settings you can check your recorded data as it is downloaded for data that exceeds the set limits.

Part Names and Functions

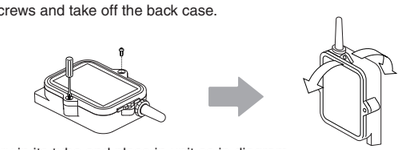
■ RTR-51 （Internal Sensor）　■ RTR-52 （External Sensor）



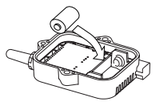
2. Setting Started

◆ Insert the batteries

1. Remove the screws and take off the back case.

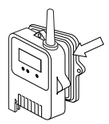


2.Insert the battery in its tube and place in unit as in diagram.



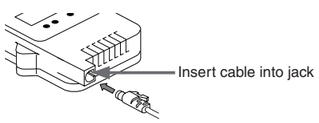
● Make sure that + and - are correct.

3. Check the rubber packing for any cuts or scratches and replace the cover as it was when opened.



● Make sure no water or foreign objects get inside the case.
● If dirt or scratches are present on the rubber packing, water resistance will be reduced.
● Be sure to fasten the cover tightly.

4. Connect the Temperature Sensor. (RTR-52 Only)
● Make sure that the sensor is properly connected by inserting it until you hear a clicking sound.



5. After Inserting the Batteries
If necessary make changes to the default recording settings according to your usage and needs. If you are going to be using wireless communication it is necessary to register the [Group Name] and [Remote Unit Name] information at this time. See [3. Settings and Communication]

NOTE:
- When changing batteries make sure to carefully read [5. Changing Batteries].
- If nothing appears on the LCD Display, please follow the above instructions again.
- Upon first installation of the batteries, measuring and recording will automatically begin at the factory set default recording settings: (Recording Interval: 10 minutes / Endless Mode / Immediate Start)
- After replacing the batteries the settings will return to the most recent recording settings.

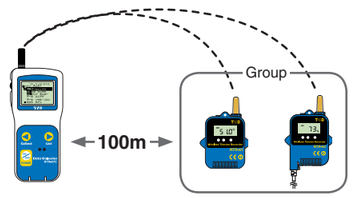
3. Settings and Communication

To start and stop recording, make or change the various recording settings and/or collect data please see the following instructions.

For details about communication please see the User's Manual that comes with the RTR-57C or the TR-50C. You can also find detailed information in the User's Manual that accompanies the software (Thermo Recorder for Windows) and in the Help Menu of the software.

◆ Using Wireless Communication with an RTR-57C Unit

By registering an RTR-51/52 unit as a Remote Unit of an RTR-57C, it is possible to carry out wireless data communication (special short wave radio) allowing you to start and stop recording, make recording condition settings and collect data without having to handle the RTR-51/52 units.



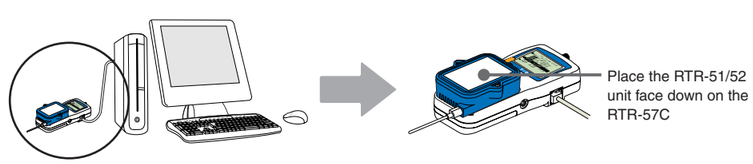
● If you are going to be using wireless communication it is necessary to register the [Group Name] and [Remote Unit Name] information in the RTR-57C units.
● The wireless communication range, if unobstructed and direct, is about 100 meters. In some cases communication cannot take place even within 100 meters. Please check first by carrying out the wireless communication test with the remote units.

◆ Optical Communication with an RTR-57C

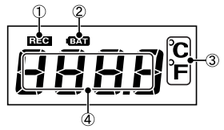
By simply placing an RTR-51/52 unit face down on an RTR-57C you can carry out recording start settings and changes, as well as, collect recorded data via optical communication.

◆ Communication with your Computer

By placing an RTR-51/52 unit face down on an RTR-57C unit that is connected to your computer, you can make any necessary recording conditions settings and changes, start recording and download recorded data easily via your computer display.

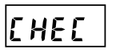


4. About the LCD Display



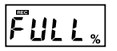
① Recording Status. (REC)
LIT UP: displayed during recording or when FULL of data.
BLINKING: displayed when waiting for a programmed recording to start.
② Low Battery Life Warning Indicator:
Displayed when time to change the battery.
③ Unit of Temperature Measurement: select from ℃ (Celsius) or ℉ (Fahrenheit)
④ Temperature Measurement Display

● Check



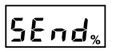
This is displayed under the following conditions: after purchasing and putting in the batteries for the first time, if the battery terminals +/- were mistaken and a short occurred, or if the batteries are replaced after having been taken out for a long period. If this is displayed, all data that had been stored in the main unit has been erased.

● Full Memory



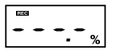
If recording under the ONE-TIME MODE, when the data readings reach the upper limit of 16,000 readings, recording will stop and this will be displayed intermittently with the current temperature.

● Wireless Transmission



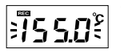
This will be displayed when transmitting data to an RTR-57C unit via wireless communication.

● No Sensor Connected (Only for RTR-52)



Displayed when a sensor has not been connected or the wire has been broken. Measurement and recording will continue and battery power consumed.

● Measurement Over Range (Only for RTR-52)



The current temperature display will blink when the temperature exceeds -60℃ or +155℃ .

Note:
Use in cold environments may cause the display to be difficult to read; this is not a malfunction.
For details about the display during battery changing see: [5. Changing Batteries]

5. Changing Batteries

NOTE: After removing the old batteries, replace them with new batteries within 1 minute.

1. When the battery power becomes low, the BAT indicator will appear on the LCD display.

Once the BAT indicator appears please change the battery as soon as possible.

Recording: OK
Wireless Communication: OK
Data Download: OK

- The recorded data will remain saved.
- If at this time a new battery is placed in the unit, recording will continue.
- After changing the battery, the BAT indicator will disappear in a short time.

2. If you do not change the battery and continue using the unit, the temperature display will intermittently display {bAtt}. Please change the battery at once.

Recording: OK
Wireless Communication: No
Data Download: No

- The recorded data will remain saved.
- If at this time a new battery is placed in the unit, recording will continue and downloading of saved data can be done.
- After changing the battery, the temperature display will return to displaying only the temperature after which the BAT indicator will disappear a short time later.

3. If you do not change the battery even under conditions in 2 above, the REC indicator will disappear and temperature display area will display [SLP].

Recording: No
Wireless Communication: No
Data Download: No

- Recording will stop and recorded data until this point will be saved.
- If at this time a new battery is placed in the unit, downloading of saved data can be done. To start recording again please set the recording conditions via your computer or RTR-57C and begin recording. See [1. Outline of System]
- After changing the battery, the temperature display will return to displaying the temperature.

4. If you do not change the battery even under conditions in 3 above, the display will go blank.
- All of the recorded data will be erased.
- If at this time a new battery is placed in the unit, [CHEC] will appear on the display after which recording will begin again using the previously set recording conditions.